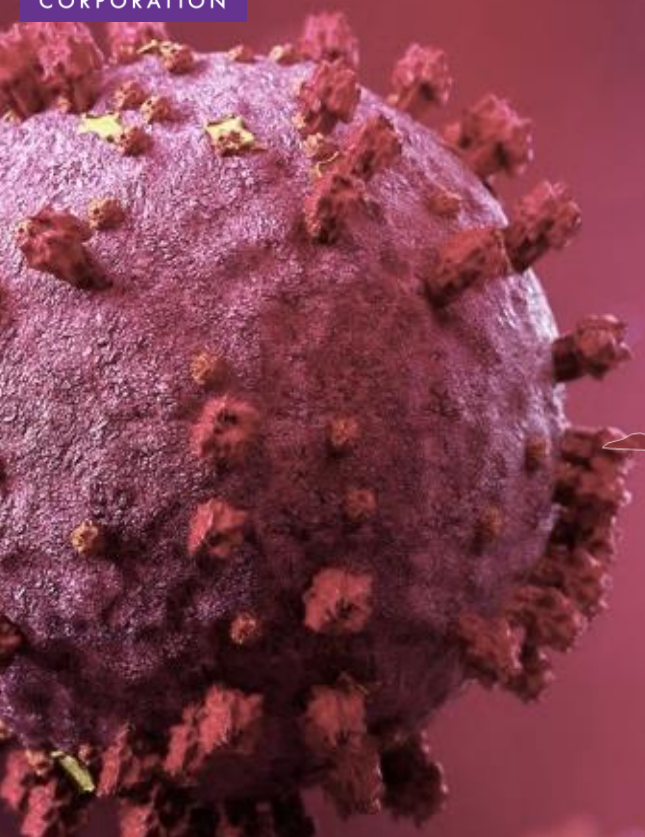
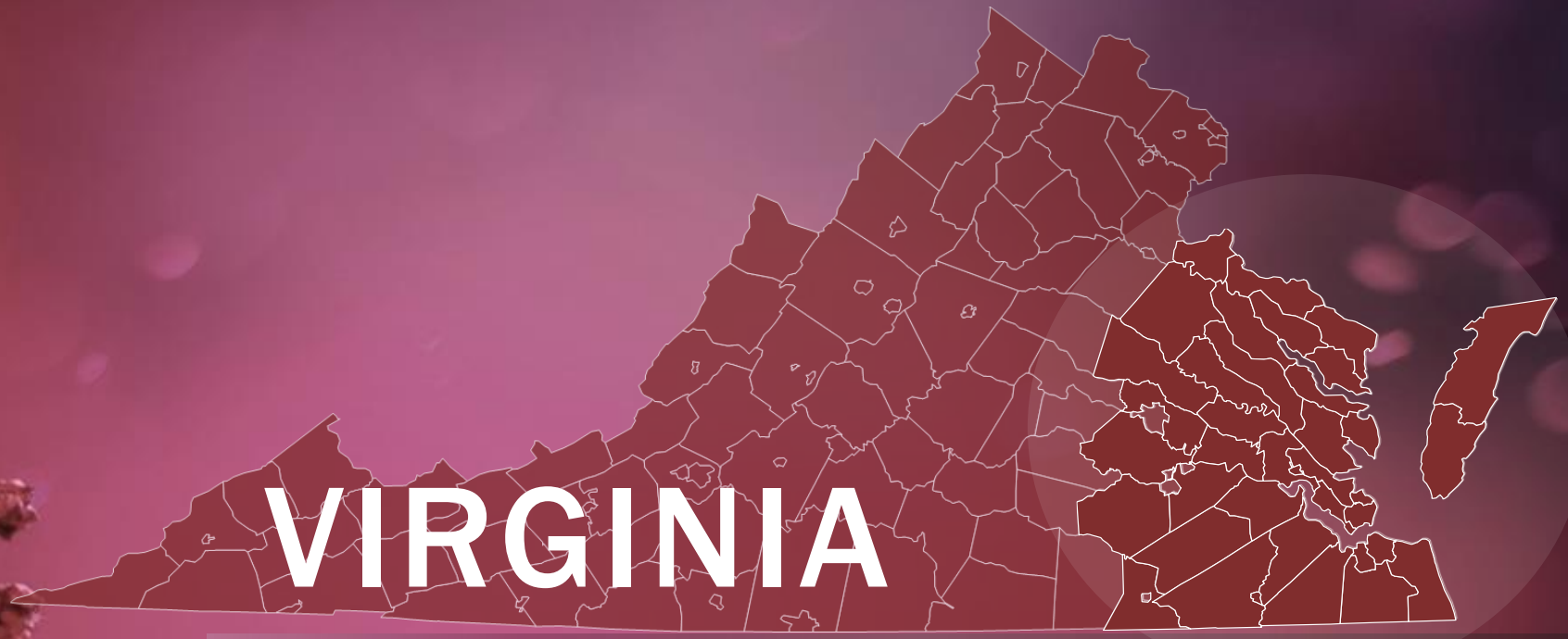




VIRGINIA

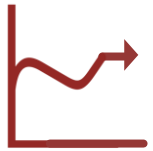
COVID-19 Update September 3rd, 2020

Carter C. Price, Ph.D.

A team of RAND researchers was asked by the Commonwealth of Virginia to review available information on COVID-19 models of the commonwealth to determine the strengths and weaknesses of each model and their relevance to decisionmaking. The work of the research team will be documented in a forthcoming RAND research report. The information in this presentation is intended to keep policymakers abreast of the latest findings of the research team.

This research was sponsored by the Commonwealth of Virginia and conducted by the RAND Corporation. RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. For more information, visit www.rand.org.

Bottom-Line Up Front



Virginia's total case level is up from last week after a few weeks of slow decline

- The case rates have risen along the border with North Carolina
- Hospitalizations continued to slowly decline

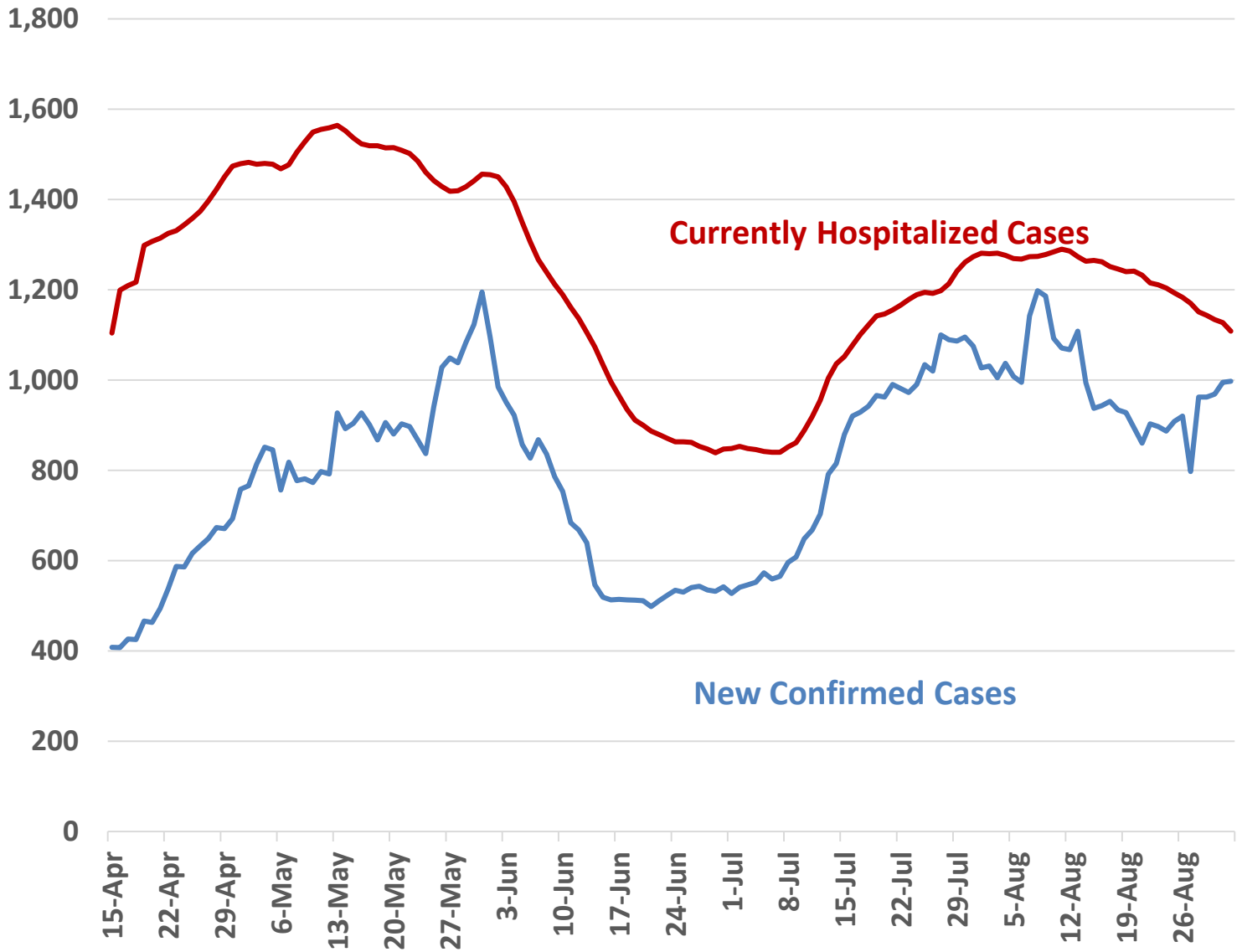
Additional triggers could lead to a rapid rise in the near term

- Seasonal changes
- Distancing fatigue
- In-person school beginning in some places
- Increased interstate travel
- Hurricane season

Modeling is less useful for forecasting because behavioral responses are driving current trends

- However, models will continue to be very useful for comparing policies and exploring scenarios
- In particular, models could be useful for understanding the effects of these triggers

The current trends indicate the latest wave is slowing



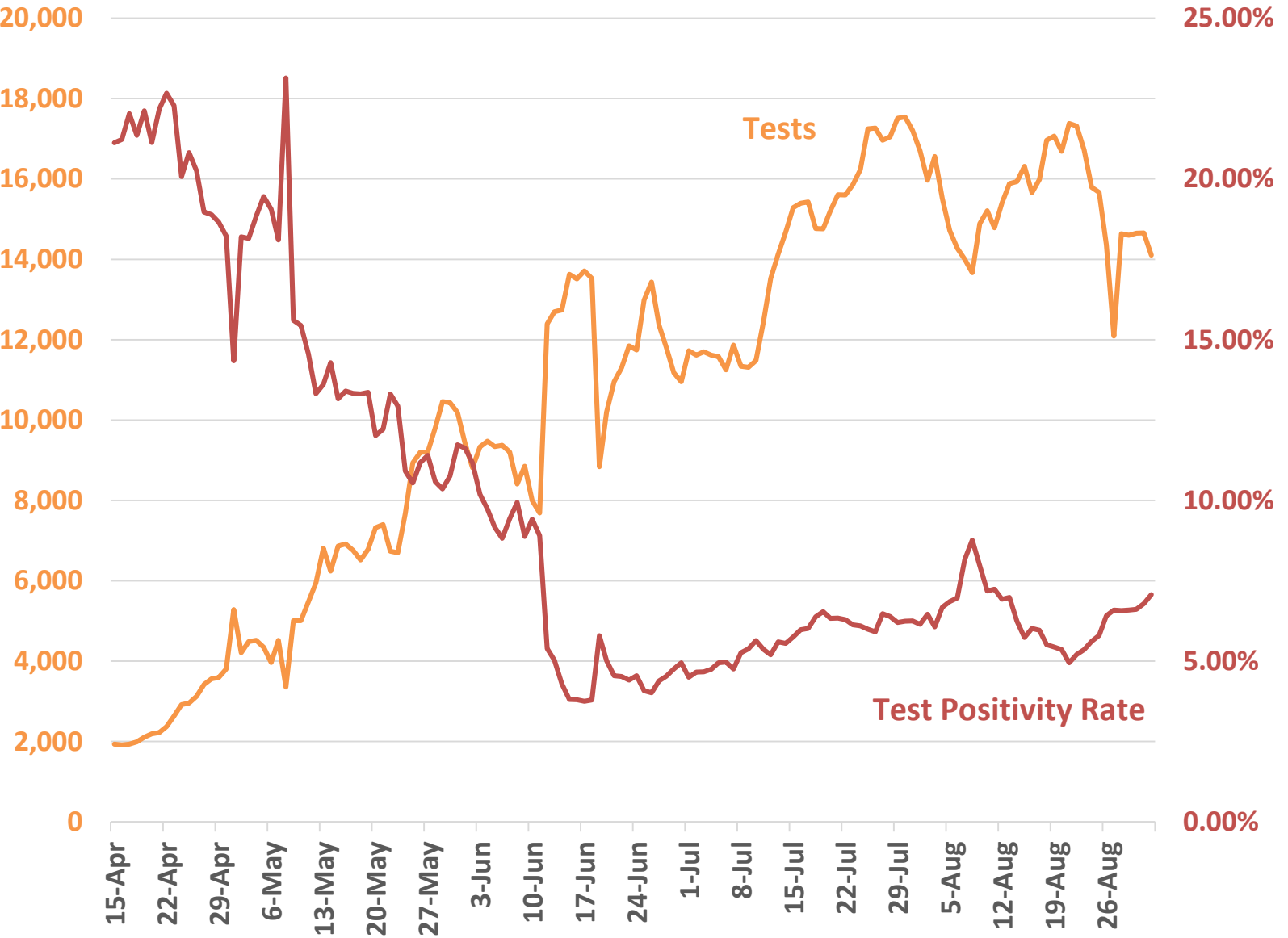
New confirmed cases have plateaued

- Cases are up slightly from last week
- Any effects from reopening schools won't likely show up for another few weeks (many have been delayed or are remote for the time being)

Currently hospitalized cases have continued to slowly decline

- This is a lagging indicator and so will likely level off or move within a range until a significant movement in the case trends

Testing levels have remained in an appropriate range for a test-and-trace strategy



Tests per day have dipped

- Testing levels are close to an appropriate pace for a test-and-trace strategy
- Further reopening is estimated to require five times more testing along with lower case rates (See Rockefeller Foundation)

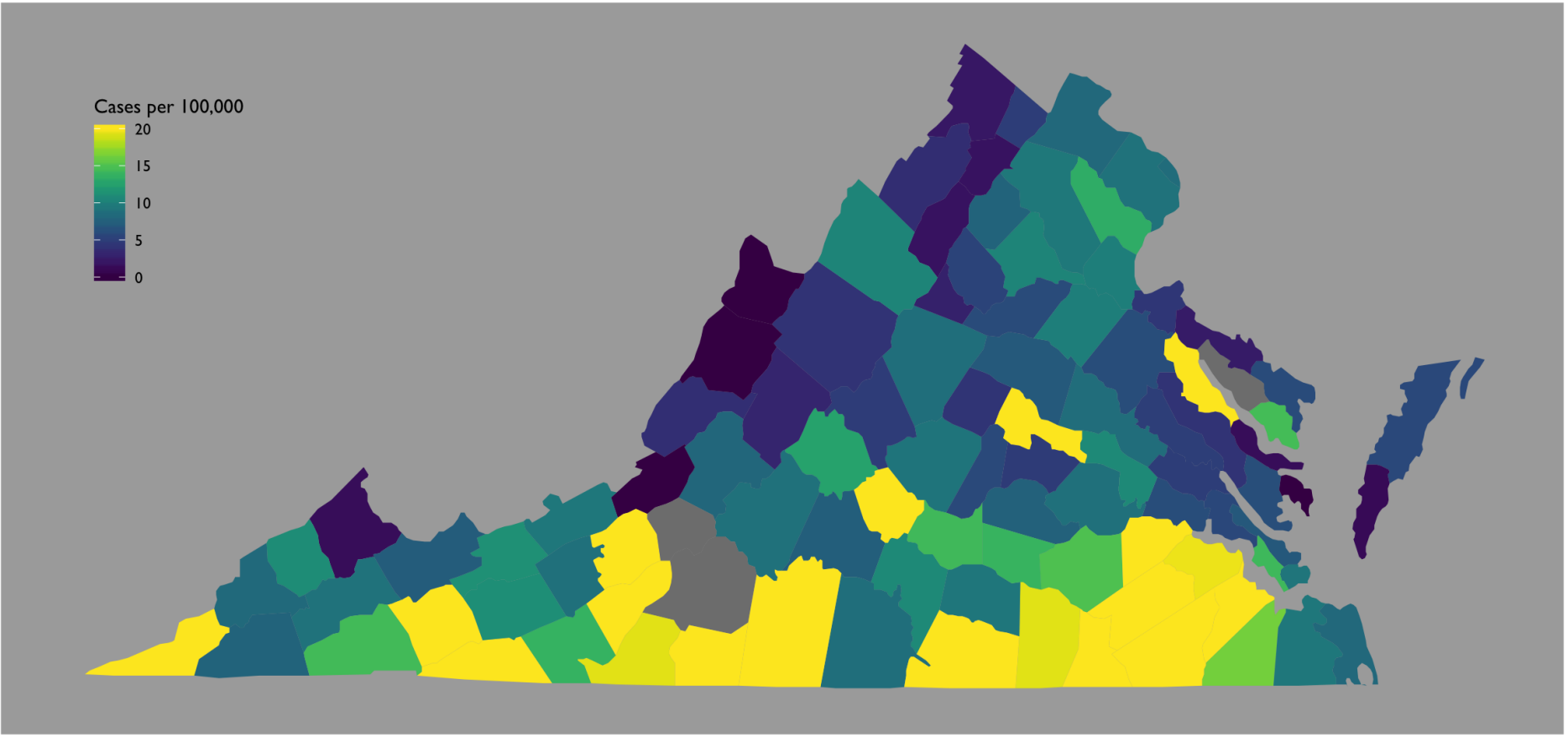
The test positivity rate is at seven percent and has been drifting up for the last two weeks

- Five percent is a suggested target

Per capita new cases are highest in the southern counties

CASE COUNT

Source: VDH



Yellow indicates at least 20 cases per 100,000

Virginia's southern counties have continued to see high case levels

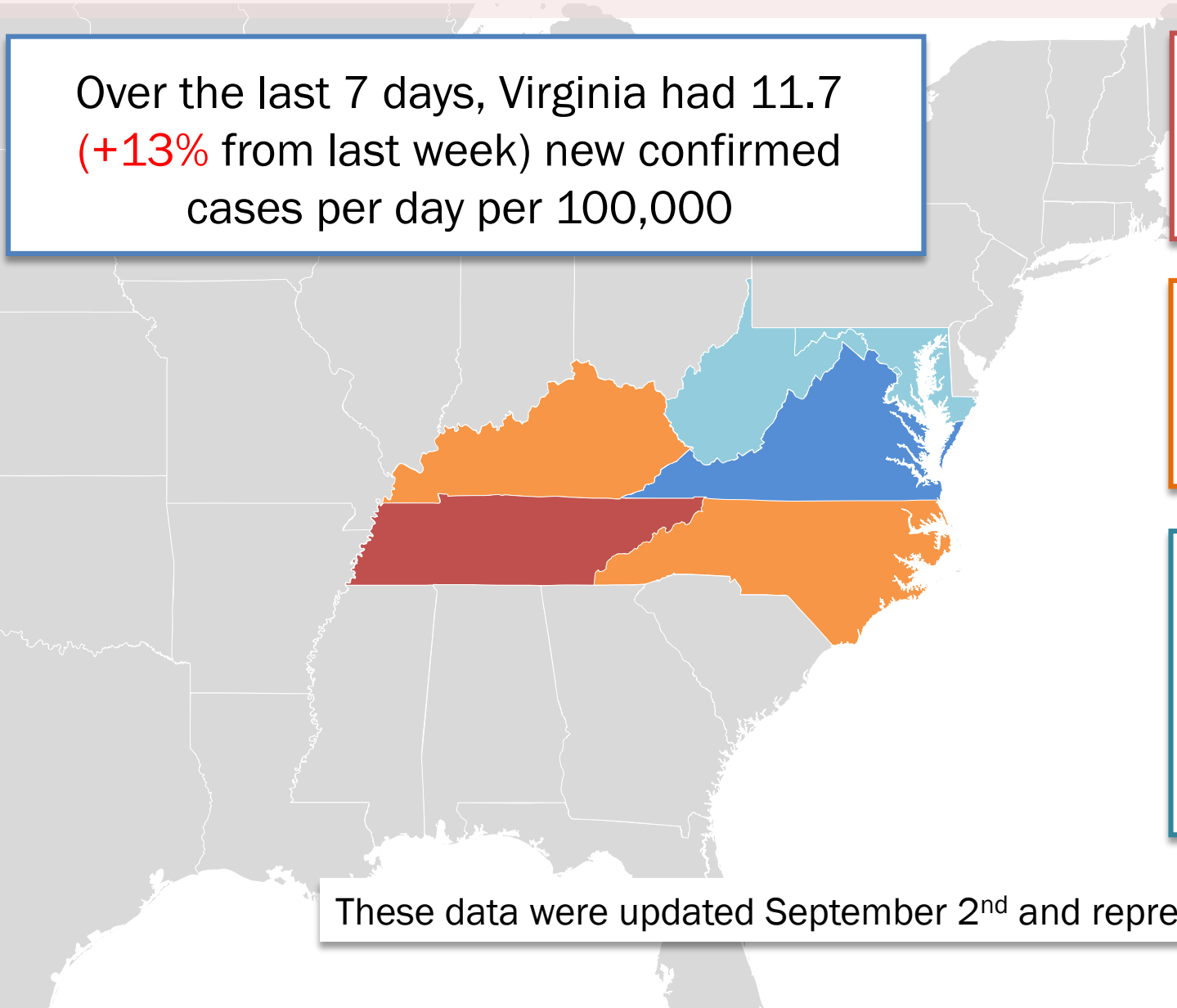
- Most of these counties have had increases

Elsewhere case counts were generally flat compared to last week

These data were updated September 2nd and represent a seven-day average of the previous week

Virginia's neighboring states may have plateaued

Over the last 7 days, Virginia had 11.7 (+13% from last week) new confirmed cases per day per 100,000



Very high case loads:
Tennessee (21.7 new cases per 100k, +3% from last week)

High case loads:
- North Carolina (14.9, +1%)
- Kentucky (13.5, +7%)

Lower case loads:
- Maryland (8.5, -23%)
- District of Columbia (7.1, -4%)
- West Virginia (7.6, +13%)

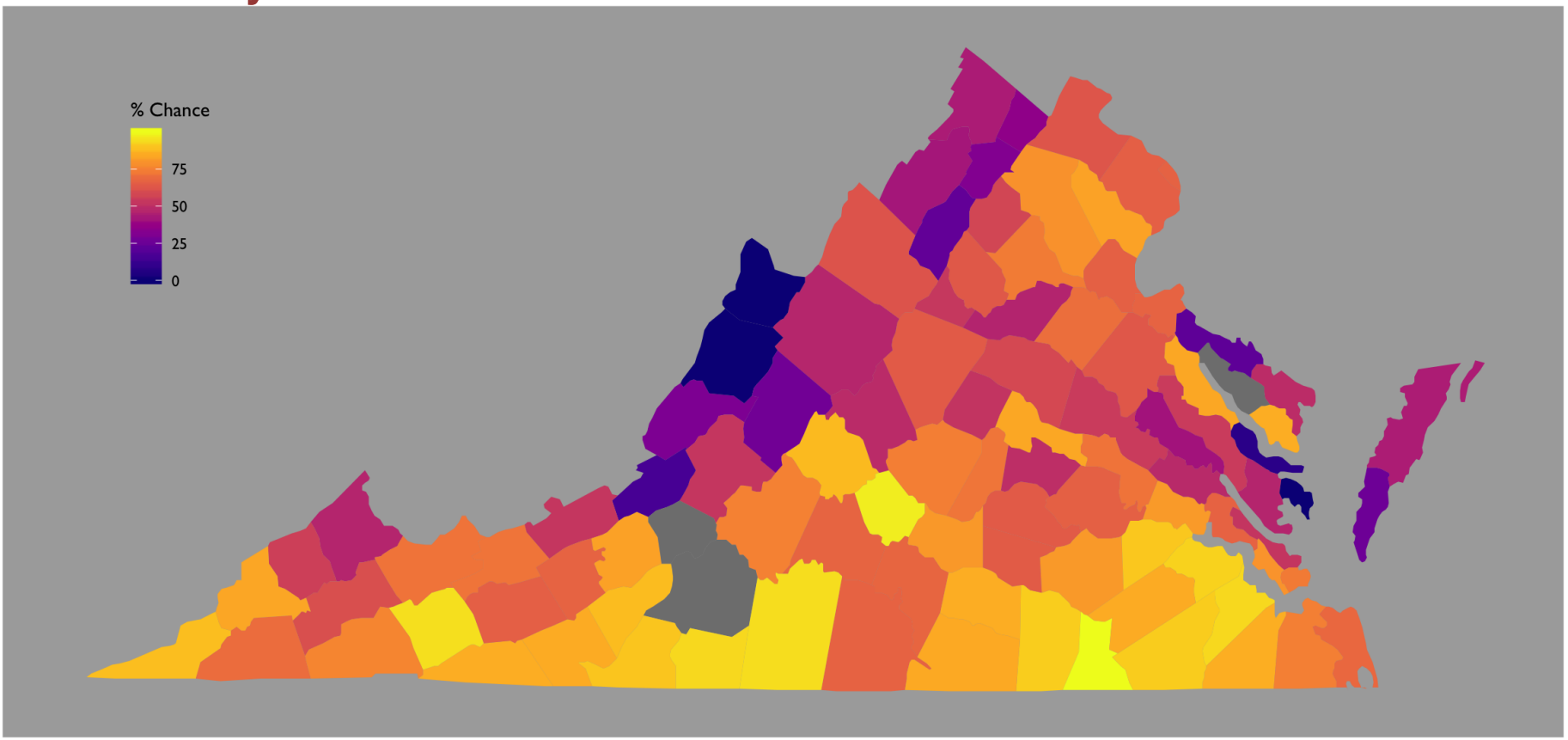
These data were updated September 2nd and represent a seven-day average of the previous week

Assessment of the near-term

	Current Hospital Census	Near-term Forecasts
Values:	**Confirmed: 800** **Pending: 330**	**Near-term: Cases estimated to decline 3% next week and remain near that level until late September** **Longer-term: Cases are expected to begin rising again in late September**
Notes:	This has declined since last week	Second peak is estimated to have occurred in the past A third peak is expected to occur sometime after November 1st
Source:	Virginia Hospital and Healthcare Association https://www.vhha.com/communications/virginia-hospital-covid-19-data-dashboard/ Accessed 9/2/2020	Youyang Gu http://covid19-projections.com/us-va Accessed 9/2/2020

Most of Virginia has better than even odds of an infected person in a school of 500 in the first week of in-person classes

Probability of at least one case in a school of 500



105 of Virginia's counties have more than a 50 percent chance of an infected person arriving in the first week

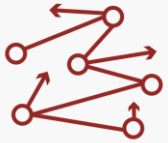
- Half of the counties have more than a 67 percent chance

Southern counties have the highest risk

In-school transmission risk will depend on precautions

These estimates are based on an approach similar to that of Fox, et al., using data from VDH and UVA

We've been monitoring recent, relevant literature



Azzimonti et al., used a social network model to simulate the flow of COVID and to test interventions

- Policies can efficiently reduce the spread if they restrict key business sectors that involve numerous interactions from different groups
- These key sectors include accommodation and food, education, entertainment, health care, and retail

Han et al., followed 91 confirmed cases of COVID in children in South Korea that were identified primarily through contact tracing

- 22 percent were asymptomatic throughout the course of their infection
- Because of the relatively mild symptoms, they estimate that only seven percent of the cases would have been identified from testing following symptom onset
- This highlights the importance of testing asymptomatic individuals and that children may be "silent spreaders"

Wilson analyzed the relationships between the spread of COVID, weather, and mobility in U.S. counties

- For a given level of mobility, higher temperatures were associated with fewer COVID-19 cases and deaths consistent with seasonality
- However, higher temperatures were also associated with higher mobility so the net effect on cases varied
- This is consistent with the patterns in Virginia with the southeast having many more cases this summer

Discussion and Questions